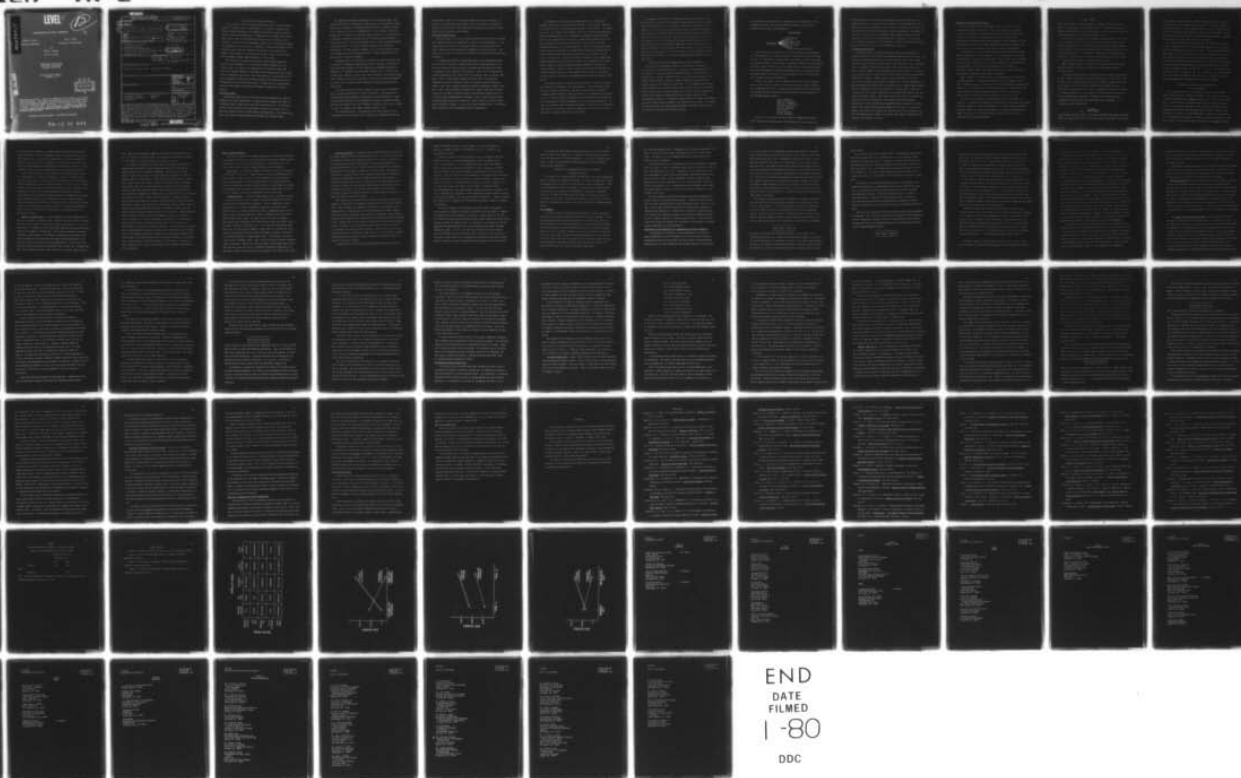AD-A078 717   OHIO STATE UNIV COLUMBUS DEPT OF PSYCHOLOGY   F/G 5/10
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THE ORGANIZATION OF SOCIAL INFORMATION

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This paper is concerned with the manner in which people cognitively organize person information when they encounter several facts about each of several persons. The traditional assumption made in social psychology that information is always organized according to persons is challenged and refuted. A series of experiments is reported that uses clustering in free recall as the measure of cognitive organization. It was found that prior familiarity with the stimulus persons strongly affected the extent to which social information was organized by persons.

The Organization of Social Information

In the course of their day-to-day activities, people receive an enormous amount of information about a large number of other people, obtained either directly through interaction and observation or indirectly through secondary sources. As has been recognized for a long time (e.g., Lippman, 1922), people cannot hope to hold in their memory each discrete item of information they encounter. To make living more manageable, people need to classify and organize this information as it is received. The manner in which people organize social information has an important bearing on the extent to which they will, for example, trust, seek out, or cooperate with others, as well as how much they will discriminate against, aggress against, or reject others.

This chapter is concerned with the manner in which people cognitively organize social information. We use the term "social information" in its broadest sense. It refers to the temporal flow of information about other people, with special emphasis on situations in which people receive two or more units of information about each of two or more persons. Most past work in the area of impression formation has studied settings in which subjects are given information about only one stimulus person. We argue that new considerations arise when the stimulus field contains information items about a variety of persons.

Historical Prelude

Soloman Asch (1946) was one of the first social psychologists to study the organization of person impressions. He started from the premise that items of information about a single person would form a perceptual unit. The resulting "gestalt" would influence the interpretation of each of the elements so as to make them consistent with the overall theme of the impression. First impressions, then, were viewed as being thematically organized into a coherent whole.

Asch explored two possible determinants of the organizing theme, trait centrality and order of presentation. Some traits (or, more generally, person features) were thought to be especially salient, vivid, or otherwise dominant so as to emerge as the focus of organization. In his research, traits such as warm and cold appeared to occupy this central position. In a similar vein, sociological literature has argued that person features that are "deviant" within a particular culture may also provide such a central organizing function in person perception. The second variable studied by Asch was order of presentation. He found evidence in support of the view that the first items in the sequence of person information provide a thematic organization into which the later items are integrated.

Subsequent work on the variables of centrality and order moved away from the question of impression organization and looked instead at the effects of these (and other) variables on trait inference and impression favorability judgments (c.f., Anderson, 1974; Rosenberg & Sedlak, 1972). Not until very recently (e.g., Anderson & Hastie, 1974; Cantor & Mischel, 1977; Ostrom, Lingle, Pryor, & Geva, in press; Wyer & Carlston, in press) have social psychologists returned to Asch's original concern regarding the thematic organization of impressions.

There has now emerged a healthy interest in American social psychology with the cognitive organization of social information. This interest has extended beyond understanding the organization of information about a single person (Asch's objective) to the organization in memory of information about several other persons (e.g., Picek, Sherman, & Shiffrin, 1975) as well as about the self (e.g., Markus, 1977; Rogers, Kuiper, & Kirker, 1977).

This renewed attention to the manner in which people organize social information is not only welcome, but it represents an important advance over

previous work in the field of impression formation and person perception. It allows us to theorize about which items of social information get categorized together, how one thought follows from another thought, and the manner in which people retrieve previously learned items.

Objectives of This Chapter

Previous research in the area of person perception has uncritically accepted the assumption made by Asch regarding the "unity" of person impressions. It was assumed by Asch, as well as by those who followed, that people automatically form a "person gestalt" when exposed to information about other persons. This tendency can be seen in the nature of both theory and research practices in person perception.

In constructing theories of person impressions, social psychologists have dealt only with the case of a single person, with no recognition given to the fact that information about one person is acquired and processed in the midst of information about a variety of other people. This is true of theories from a Gestalt perspective (Asch, 1946; Krech & Crutchfield, 1948; De Charms, 1968; Heider, 1958), a reinforcement perspective (Byrne, 1971), an information integration perspective (Anderson, 1974), an attribution theory perspective (Kelley, 1967), and a cognitive structure perspective (Rosenberg & Sedlak, 1972; Scott, 1969). They all appear to be based on the premise that people naturally isolate all the items of information about each person and somehow treat it as a collective when making impression responses. None of these theories provide an understanding of when or how people do, in fact, organize the flow of information according to persons. It is as if all these theorists take it for granted that the person is the only meaningful focus of organization.

This assumption has also affected research practices. The empirical paradigms used by most investigators have the effect of perceptually isolating the information about one person from the information about another. For example, in both the trait judgment task (Anderson, 1974; Asch, 1946) and the similarity-attraction paradigm (Byrne, 1971) information is blocked by stimulus persons. That is, the information about one person is exhaustively presented in a block before information about anyone else is given. This, of course, is quite discrepant from what occurs in day-to-day life. Except for certain occupations (a psychiatrist who sees patients in sequentially blocked time periods) most of us have repeated intermittent encounters with a variety of persons over the course of a typical day. Despite the relative frequency of such intermittently acquired information in day-to-day life, nearly all contemporary social psychological research on person perception presents information to subjects in a "blocked" fashion. There is clearly a need to develop empirical procedures for studying how people organize social information when the flow of information about one person is arbitrarily interspersed among information items about other persons.

This chapter explores the possibility that there are a variety of factors that determine the strength of the "person gestalt." When the stimulus field contains a variety of information items about several people, there may be circumstances under which the information items are not organized around persons at all. We view the problem of discovering the determinants of the strength of the "person gestalt" as being fundamental to all work in person perception. If there is no cognitive unit representing the person, there can be no within-person organization of information. Under such conditions it would not make sense to talk about an organized impression of the person.

The remainder of this chapter is divided into four major sections. The first provides an analysis of the concept of organization by person and outlines a methodology (clustering in free recall) by which person organization can be studied. The second section reviews relevent previous research that employed this methodology. The implications of these findings for understanding person perception will also be described. The third section presents data that refutes the assumption that social information is always organized around persons. It then introduces the notion that prior familiarity with the person serves as a primary determinant of the strength of the "person gestalt." The last section describes the implications of the present approach for other problems in social and personality psychology. We also provide suggestions for future research in that section.

Analysis of the Cognitive Organization of Social Information

An item of social information refers to any feature or characteristic of a person that is descriminable (i.e., represents an identifiable unit) by the observer. It may be an observed behavior sequence, a belief about the person's past, a physical feature, a trait, or any other of a multitude of such possible characteristics. Naturally enough, features are associated with a specific person at the time they are perceived. In the language of associative network theories (e.g., Anderson & Bower, 1973; Collins & Loftus, 1975, Kintsch, 1974), a person node is created in memory when the first item of information is received and a pathway is established between the person node and a node representing the feature. As additional characteristics of a person are observed, new feature nodes and their pathways to the person node are created. Such models of person perception have been proposed by Anderson and Hastie (1974), Ostrom, et. al. (in press), and Wyer and Carlston (in press).

An illustration is given below for a hypothetical person named Bill. He is remembered as being a shy, male, coal miner who smiles a lot and who the perceiver met at a party last New Years eve.

Feature Nodes

Person Node

- divorced
- male
- name is Bill
- smiles a lot
- coal miner
- shy
- met at New Years eve party
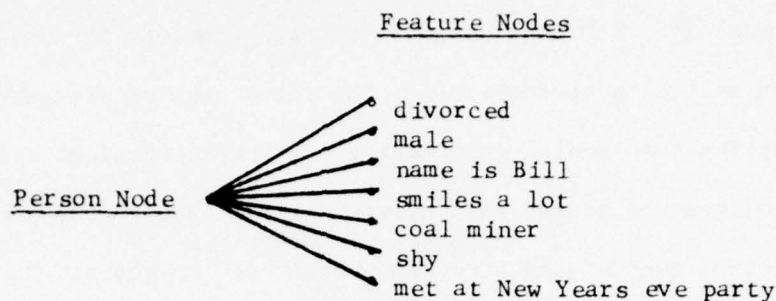
The above provides an illustration of social information being organized by a "person gestalt"; all items are related to each other by virtue of having pathways to a common node, the person node. Asch (1946) no doubt created such an associative network in his research on impression formation since his subjects were given a list of traits all of which characterized a single stimulus person. This traditional impression formation methodology offers no competing items of information (about other people, or about non-person objects and events) that could interfere with person organization.

Consider, for example, that our observer saw two other persons (besides Bill) at the New Years Eve party. Susan was an attractive airline stewardess who was unmarried and Abe was a surgeon with four kids who likes to drink beer. The observer may have encountered the several items of social information in the following temporal sequence.

Bill is divorced
Susan is attractive
Susan is a stewardess
Abe likes to drink beer
Bill is a coal miner
Susan is unmarried
Bill is shy
Abe is a surgeon
Abe has four kids

It is by no means certain that when trying to remember these items of social information the morning after (on New Years day), that they will be

organized by person. The observer may remember meeting a divorced person, an
unmarried person, and a person with four children, but not remember which was the
surgeon, the airline stewardess, or the coal miner. We will at a later point in
the chapter discuss several alternatives to person organization. Our concern at
this point is to establish the plausibility that alternative modes of organi-
zation exist and may well be adopted under some circumstances. We turn next
to describing a methodology that will allow us to study the conditions under which
people do and do not organize social information by persons.

Clustering in Free Recall

The manner in which an observer organizes information about persons in
memory will affect the way in which the information items are later recalled. One
technique for studying organization is to have subjects learn a list of words
and then to recall them in the order in which they come to mind (e.g., Bousfield,
1953). For example, subjects may be given a list of words that contains the
names of animals randomly interspersed among the names of flowers. It is found
that the order in which items are listed in free recall reflects their associative
organization in memory. Subjects tend to cluster the animals in one part
of the recall sequence and the flowers in another part. This is interpreted to
mean that despite the random order of presentation in the learning phase, subjects
mentally compartmentalize the two categories of stimulus items. Items within
a category are more strongly associated with one another than they are with the
items in the other category. When asked to recall the entire set of items, the
sequence of recall is determined by the strongest associative pathways.
Analogously, if social information is organized around the person, it would be
expected that person clustering should emerge in free recall. In the earlier
example, there should be a tendency for the Susan items to group together, the
Abe items should appear together, and the Bill items should be together if the
items had been organized by person.

Measures of Clustering in Free Recall

This section describes two alternative indices that can be used for measuring clustering in free recall. Since the presentation is somewhat technical and detailed, it may distract the reader from the more substantive concerns in this chapter. However, we believe that since most social psychologists are unfamiliar with these procedures, a brief digression at this point should not only help the reader to better understand our findings, but also be of use to other researchers who wish to adopt this methodology.

During the last ten years numerous measures have been proposed to assess memorial organization of lists of words. All of these measures to date have been guided more by intuitive criteria than by theory (Colle, 1972; Sternberg & Tulving, 1977), and there is as yet little consensus as to which measure is most appropriate or even under what circumstances a given measure is appropriate (Shuell, 1969). Discussed in turn below are two of the measures of categorical clustering we have used in our research.

SCR. In 1966 A. K. Bousfield and W. A. Bousfield proposed a formula for a deviation measure of categorical clustering that was to stimulate a great deal of research as well as a plethora of other clustering indices mathematically related to it. In distinction to the "Ratio of Repetition" measure which the latter author had originally proposed (Bousfield, 1953), the new formula assumed that all items presented were not equally available at recall.

The basic unit of analysis for measuring categorical clustering is the repetition. A repetition is defined as occurring any time two items from the same conceptual category are reported contiguously. An observed Stimulus Category Repetition (SCR), then, indicates the amount of clustering represented by the number of repetitions. The expected number of repetitions in a list is represented by the following formula:

$$E(SCR) = \frac{\Sigma m^2}{N} - 1$$

where m is the number of words recalled in a category k and N is the total number of words recalled. The deviation measure of categorical clustering is therefore 0(SCR)-E(SCR) and reflects the degree to which the observed number of repetitions differs from the number expected by chance.

One potential limitation of this deviation clustering index is that there is no fixed upper limit. As has been pointed out by other researchers (e.g., Roenker, Thompson, & Brown, 1971) this characteristic may introduce ambiguity of interpretation in those situations where there are large differences in the number of items recalled. For example, although perfect clustering might be achieved in a shorter list, the SCR value could be smaller than that obtained in a longer list where perfect clustering was not achieved.

ARC. Roenker, Thompson, and Brown (1971) and Gerjouy and Spitz (1966) separately proposed a measure of categorical clustering that has proven especially useful.

Like SCR the Adjusted Ratio of Clustering (ARC) has chance clustering set at zero. Unlike SCR, however, perfect clustering is set at unity (1) for ARC. The ARC score in effect represents the ratio of obtained category repetitions above chance to the total possible category repetitions above chance. Its usefulness is enhanced by the fact that it is minimally affected by the number of categories recalled, the total number of items recalled, and the distribution of items across categories. Therefore, direct comparisons can meaningfully be made between and within subjects and experiments. It is computed by the following formula:

$$ARC = \frac{R - E(R)}{Max\ R - E(R)}$$

where R equals the total number of observed repetitions, E(R) equals the chance number of category repetitions and is computed with the Bousfield and Bousfield

(1966) formula for E(SCR) and Max R equals the maximum number of category repetitions (i.e., Max R= N-k where k is the number of recalled categories). Over several different studies, Simpson (1979) found that ARC correlated .90 or better with several other indices of clustering (including SRC). We have found this to be the most useful of the several indexes and will be reporting it exclusively in the empirical portion of this chapter.

One potential limitation of ARC as an index of categorical clustering is that a negative score does not have the same meaning as a positive score under many circumstances (Frankel & Cole, 1971). This is because whereas the upper limit of ARC is 1.00 and chance is zero, the lower limit is not -1.00. This problem can be particularly acute in situations where recall is poor. Consider the following hypothetical example where a subject recalls two words from one conceptual category and only one word from another with the single instance intervening between the other two. (e.g., the recall sequence: Bill is divorced, Susan is attractive, Bill is a coal miner). For this particular case $R = 0$, $E(R) = 0.67$, Max R = 1.00, ARC = -2.03. Fortunately, we have rarely encountered such large negative values in this research.

Contribution of Previous Clustering Research
to Person Perception

By and large most previous clustering research has employed rather austere stimulus material, frequently composed of sets of nouns that can be classified consensually into a priori categories (e.g., foods, trees, cities, etc.). On the other hand, information about persons is far more varied in content. It may include appearance, traits, attitudes, behavior episodes, memberships, friendships, and demographic characteristics. There are also differences in the manner in which information is acquired by the observer. Most clustering research presents the stimuli sequentially one word at a time, with no direct connection made between the word and the a priori categories.

In learning about persons, information generally must be extracted from a much more complicated stimulus field. Furthermore, one directly apprehends a linkage between the person and the information item. That is, in clustering research, the subject is not explicitly told that the term "oak" is an instance of a "building materials" category. However, in person perception such a linkage is almost always explicit. The memory item "surgeon" is directly associated with the person Abe.

Despite these clear differences between most clustering research and the nature of person organization processes, it will still prove useful to selectively review past clustering research and relate it to issues in person perception. Below we discuss several variables that have been found to affect the degree to which information is clustered by category or associative strength in recall.

Temporal blocking of information. Blocking (i.e., presenting all items from a single category contiguously during list presentation) enhances clustering compared to random presentation for both high and low frequency words (Cofer & Reicher, 1963; Cofer, 1967; Cofer, Bruce, & Reicher, 1966, Dallett, 1964, Puff, 1966). This superiority in clustering for blocked over random presentation of words also holds when the stimuli consist of factual material presented in complex sentences (Balser, 1972). This body of research suggests that there would be a greater likelihood of subjects organizing their recall of facts about persons according to persons if they acquired all the information about one person before learning information about a new person. Temporal blocking of information occurs in such structured and unstructured social encounters as job interviews and meeting strangers on a plane trip.

Task orientation. A second variable that affects organization of recall is the task orientation (set) of subjects. For example, Marshall and Cofer (1961) presented subjects with mixed lists of categorized or uncategorized word pairs at two levels of associative strength under either a set or a no-set condition. In the set condition subjects were instructed that they might notice relations among some of the words that would facilitate recall. The results showed that such a set enhanced clustering for both categorized and un-categorized pairs of words that shared a high number of associates but no differential effect for instructions occurred when associative strength was low.

Another kind of task orientation manipulation that has been shown to reliably affect clustering of recall is that used by Jenkins and his colleagues. [Hyde, 1973; Hyde & Jenkins (1969) and recently by Mueller (1978)]. In investigations using this procedure subjects are presented with a list of words (say, four filler words and 12 pairs of medium strength associates) in a random order. Some subjects are required to perform a semantic orienting task (e.g., rating each word for pleasantness) while other subjects are engaged in a non-semantic task (e.g., searching for words which have the letter "e" in them). The typical result is that the semantic orienting task results in reliably greater clustering than the nonsemantic task.

In a number of research contexts social psychologists have shown an interest in the effects of task orientation on impressions. Zajonc's (1960) theory of cognitive tuning predicts that a person who expects to transmit a message to another person should have a rigid, polarized cognitive orientation toward stimulus information whereas a person not expecting to transmit infor-mation should have a more flexible cognitive structure. Hence, one's cognitive set may mediate impressions formed of another person.

In accord with this formulation, research by Cohen (1961), Brock and Fromkin (1968), and Harvey, Harkins, and Kagehiro (1976) has demonstrated that such a task variable affects polarization of impressions, receptivity to supportive information, and attributions of causality. One might also expect that such a cognitive tuning manipulation would affect the organization of recall of person information with transmitters demonstrating more clustering than receivers.

Another task variable of recent interest to social psychologists is that of an impression vs. a recall task orientation. Hamilton, Katz and Leirer (in press) have found that recall of person information is greater for subjects having an impression set than for subjects having a recall set. Using a similar manipulation but presenting subjects with videotapes of person behaviors Cohen and Ebbesen (in press) have found that impression subjects use fewer but larger temporal units than memory subjects and that the boundaries of the units used by impression subjects do not correspond to those of memory subjects. (Subjects indicated the boundaries of the units they were employing by pressing a button as they observed the behavioral stream.) It would seem worthwhile to explore how such a task orientation would affect the organization of the information recalled.

Number of learning trials. A third variable that affects organization of recall is the number of learning trials. Bousfield and Cohen (1953), for example presented a four category, 40 item list to subjects for either 1, 2, 3, 4, or 5 trials prior to a single free recall period and found that clustering was directly related to the number of presentations. Other research (Bousfield, Berkowitz, & Whitmarsh, 1959; Marshall, 1967; Robinson, 1966) using an alternative study-recall procedure has also shown that clustering increases progressively as a function of trials, and this has also been demonstrated to hold true for idiosyncratic subjective organization (Bousfield, Puff, & Cowan, 1964; Tulving, 1962). Cofer and his associates (Cofer, 1967, Cofer, Bruce, & Reicher, 1966; Gonzalez &

Cofer, 1959) have investigated changes in clustering from an immediate-recall test to a second test 5 minutes later. In general they have found an increase in clustering and a decrease in recall as a function of delay.

The results of this group of studies suggest the potential usefulness of examining how organization of person impressions change over time and with repeated presentations of stimulus information. This research also seems germane to some recent research in social psychology concerning the effects of thinking about an attitude object. Tesser and his colleagues (Tesser & Cowan, 1977, Tesser & Leone, 1977; Sadler & Tesser, 1973; Clary, Tesser, & Downing, 1978; Tesser, 1978) have recently argued that 1) persons have well developed schemas for processing information about other persons and 2) under certain theory-specified circumstances, thinking about an attitude object (e.g., a person) can polarize the attitude. Sadler and Tesser (1973), for example presented subjects with either negative or positive information about a potential partner, had subjects indicate their liking for the individual, and then either distracted subjects from thinking about the individual or encouraged thinking about the individual before subjects rated the partner for a second time. Though-condition subjects tended to polarize their second judgments compared to distraction-condition subjects. In order to understand this phenomenon it is paramount to find indices other than the usual polarization index that are sensitive to manipulations of the amount of time spent thinking. The two explanations advanced (i.e., thought generates consistent cognitions and thought results in reinterpretation of inconsistent cognitions) to explain this polarization phenomenon lead one to predict that thought should result in enhanced clustering of related facts about a person that are initially presented in a random order. Clustering of these cognitions about a person should provide a more consistent representation of the individual.

Organizational Strategies

The studies reviewed above describe conditions that increase the liklihood of categorical clustering, but do not specify the alternative categorical bases people might use. When a subject is presented a list of stimuli in a free recall task, several alternative memory strategies could be adopted.

Serial order. One strategy is simply to attempt to recall the information on the basis of serial order. Mandler and Dean (1969) have demonstrated that subjects show a marked tendency to recall information in the same order in which it was presented. It seems unlikely that such a strategy would prove useful in an impression formation situation unless one were presented a minimum of information, were expecting no intervening events between input and need to recall, or wished to retain the information for only a short time.

Category salience. A second strategy subjects tend to use when presented a list in a free recall task is to group the stimulus information in terms of the most salient organizational categories. There is considerable evidence indicating that as conceptual categories become more salient and easy to discover there is a greater likelihood of subjects organizing their recall in terms of those categories (Bousfield, Cohen, & Whitmarsh, 1958; Cofer, 1965; Mandler, 1967; Shuell, 1969). One might expect, then, that if a subject was presented with information about several persons whose most salient difference was, for example, occupation, race, or sex, that these differences might function as the most salient categories. Facts about all the males may be put together in one category and facts about the females in another. Organization of the person information in memory might reflect that salience (see Taylor, Fiske, Etcoff, & Ruderman, 1978). When, on the other hand no obvious categorical scheme is available, subjects will find more subtle relationships among stimuli. Even then there often will still be substantial commonality among subjects in the manner in which they group their recall (Earhard, 1967; Tulving, 1962, 1965).

Competing Categories. An especially interesting situation arises when (or if) people organize information in more than one way. The concern here is with determining the factors that increase or decrease the relative utilization of one organizational heuristic over another. For example, Dolinsky (1972) presented subjects with a list of words that could be grouped only according to associations, only according to rhymes, or in terms of both. When subjects could choose to organize their recall according to associates or according to rhymes they overwhelmingly chose the former strategy and this associative clustering increased across trials. When subjects could only organize recall according to rhymes there was weak but reliable rhyme clustering which also increased across trials. When subjects could organize their recall only according to associations subjects did so to a reliably greater degree than when they could only organize by rhymes.

Other studies in a similar vein have compared the relative utilization of taxonomic (categorical) vs. alphabetical organization in lists (Lauer & Battig, 1972). When a stimulus list composed of words that can be organized either alphabetically or categorically is blocked alphabetically at input, subjects demonstrate greater categorical than alphabetical clustering. Similar subject preference for categorical over alphabetical clustering has been found by Mueller (1978). Assuming that the two potential organizational heuristics were equally salient to subjects in these studies (an assumption which was not tested) it is conceivable that subjects may have chosen to organize their recall in the manner they were most accustomed to using. That is, it is reasonable to assume that subjects do not ordinarily organize information according to rhyme or initial letter of the alphabet.

Studies such as the above and those described immediately below, then,

suggest a procedure by which one could compare the relative strength of a tendency to organize information according to persons vs according to other organizational schemes.

Perlmutter and Royer (1973) and Divesta, Schultz, and Dangel (1973) have examined the effect of competing organizational schemes on organization of recall of prose passages. In the Perlmutter and Royer (1973) study subjects were presented prose paragraphs concerning the climate, language, chief agricultural products, chief industrial products, and geography of five fictious countries. The test stimuli were five paragraphs of five sentences each organized either by the country's name, attributes, or randomly presented. Subjects were required to recall the information either organized by name, by attribute, or in the order that things came to mind. For all subjects a distractor task of counting backwards was interpolated between stimulus presentation and recall. The results indicated that independent of input organization subjects tended to cluster their recall according to how they were requested to organize it. That is, subjects were equally able to organize their recall either according to names or according to attributes.

Free recall subjects in the Perlmutter and Royer (1973) study showed a strong tendency to organize their recall according to names and almost no tendency to organize their recall according to attributes. Similar preference for name over attribute clustering has been found by Frase (1969), Schultz and Divesta (1972), and Myers, Pezdek, and Coulson (1973). On the basis of this evidence it has been suggested that name organization is the more spontaneous and natural strategy (Shimmerlik, 1978). If this is the case then one might expect that subjects presented information about persons that could be organized either according to attributes or names should show a preference for organization according to names. Herstein, Carroll, and Hayes (in press) provide some support for this prediction.

On the basis of this review of research dealing with the role of organization in memory there appear to be a number of variables that are likely to affect the organization of person information. A free recall paradigm appears useful to study the organization of person information and the variables affecting such organization.

Research on the Organization of Social Information

According to Persons

The research just reviewed supports the hypothesis that social information should, in general, be organized by persons. The long time assumption of social psychologists that there exists a "person gestalt" would seem warranted. Often the information about others is blocked, is acquired under an impression set, and (especially for appearance and mannerism) is encountered on repeated occasions. All three of these factors were shown to increase the extent of clustering in free recall. This section describes the results of our investigations on the questions of when and how social information is organized around persons.

Pilot Research

In an initial pilot investigation the possibility of persons serving as organizing foci in memory was explored using the free recall paradigm. It was hypothesized that subjects ordinarily would tend to cluster their recall of social information on a person-by-person basis. Subjects (N=20) were verbally presented three items of familiar information about each of three well-known persons (a total of 9 items) and asked to recall all the items in the order in which they came to mind. The three persons were designated by the letter "A", "X" and "Q" rather than their real names (the facts referred to Elvis Presley, George Washington, and Abraham Lincoln). The nine items were read to the subjects three times, each time in a different random order.

(The order was randomized with the constraint that if subjects recalled all nine items in the order they were read, clustering would occur at exactly chance level). Following each of the readings subjects wrote down as many of the items as they could remember.

As mentioned previously, the ARC measure was used as our index of clustering in all our studies. Chance clustering of this index has a value of zero and perfect clustering has a value of 1.0. Averaging over all three trials in the pilot investigation, overall person clustering was substantially greater than chance ($\overline{X} = .68$, $p < .001$). Also, a significant increase in clustering was observed over the three trials ($\overline{X}$'s = .54, .71, & .80, $p < .001$). These data provide clear support for the conclusion that social information can be organized around persons in memory and that this organization influences the patterning of free recall.

The above findings are perfectly consistent with Asch's assumption that social perception is organized around persons. It should be noted, however, that this study used familiar facts about well-known persons. This is in contrast to most person perception research which employes Asch's approach of studying "first impressions" of hypothetical or unfamiliar stimulus persons. It is possible that information sequences concerning such unfamiliar persons are not so readily organized on a person-by-person basis. We next describe a series of studies that analyzes the contribution of familiarity to a person-focused organization of social information.

Familiarity as a Determinant of the Organization of Person Information

In analyzing the contribution of person familiarity to a person-by-person organization of social information, our first goal was to develop a methodology by which we could assess the relative degree of person-focused organization of the same information under varying conditions of familiarity.

To this end, a group of 30 undergraduate subjects participated in a pre-test study in which they were asked to write down the names of the first three well-known persons that came to mind. Subsequently, subjects were asked to list the first three familiar facts that came to mind about each of the three persons they had listed. These names and facts were tabulated across subjects and the twenty most frequently mentioned names were selected. These names were divided into four sets of five on the basis of maximizing the heterogeneity within each set. Five of the most frquently mentioned facts about each person were selected and converted to generalities that would not uniquely distinguish the person. For example, "George Washington was the first president of the United States" was converted "George Washington was a leader." These generalities will henceforth be referred to as "descriptors." It should be noted that descriptors were either nouns or adjectives.

For purposes of manipulating person familiarity, five names and accompanying five descriptors for each name were arranged into 5X5 matrices, such as the one shown in Figure 1. The rows in this matrix provide the description of the five familiar persons and the columns represent the five unfamiliar persons. The particular positioning of descriptors within the rows of these matrices was first randomly determined and subsequently rearranged when the unfamiliar persons (represented by the columns) were inconsistent or improbable.

Insert Figure 1 about here

The names of the unfamiliar persons were equated in letter length to the familiar names for each set. Using this counterbalancing scheme it is possible to construe the same set of descriptors in terms of both familiar and unfamiliar persons. In the studies reported below information items were formed by combining familiar or unfamiliar names with descriptors in sentences with the verbs

"is" or "was."

In an initial study (Pryor & Ostrom, 1979), 48 undergraduate subjects were verbally presented with all four stimulus sets, two in the familiar version and two in the unfamiliar version. Following each presentation subjects were instructed in recall the information items and write them down in the order in which they came to mind. The exposure/recall sequence was presented twice for each stimulus set. A booklet of paper slips was provided and subjects were instructed to write one recalled item on each consecutive slip without looking back.

In addition to the procedures mentioned thus far, this experiment also examined the generality of organizational factors across different set sizes. The 5 x 5 information matrices as shown in Figure 1 were used to generate three additional set types. From each of these matrices, a 3 person x 3 descriptor matrix, a 3 person x 5 descriptor matrix, and a 5 person x 3 descriptor matrix was generated for both familiar and unfamiliar versions. These four stimulus set types constituted two two-level between-subjects variables.

ARC scores were computed for the recall protocols with persons considered as categories. As in the pilot study, errors were ignored in this computation. A recall response was considered correct in this analysis only if both name and descriptor were correct (analyses based on a less restrictive definition of error yielded comprable results).

Insert Figure 2 about here

Figure 2 shows how clustering was affected by trials and by levels of person familiarity. An analysis of variance indicated significant main effects for familiarity (F (1, 44) = 25.66, $p < .001$) and for trials (F (1, 44) = 7.89, $p < .001$). No interactions or main effects involving number of persons or number of descriptors were obtained (all p's > .20). In Figure 2 the mean ARC scores were significantly different from zero (p's < .001) in all cells except in the first trial of the unfamiliar condition (F (1, 44) = 2.35, $p > .10$).

Thus, subjects tended to organize their recall around persons more if the information concerns familiar (or famous) persons than if it pertains to unfamiliar persons. Person-by-person organization also increased as subjects had more experience with the information sets. It is interesting to note that no significant degree of person-by-person organization existed in the first trial with the unfamiliar persons. This finding implies that studies of first impressions of unfamiliar stimulus persons should not necessarily assume that the person constitutes an integral unit of social perception.

Additional analyses were performed upon the number of items recalled correctly (where correct items represent a correct name and descriptive pairing) and the number of errors across experimental conditions. Noteworthy in these analyses is that the number recalled was higher in the familiar than in the unfamiliar condition and higher on trial 2 than on trial 1. More errors were made in the unfamiliar than in the familiar conditions and more errors were made on trial 1 than trial 2. The possibility exists, then, that the obtained clustering differences resulted from differences in amount recalled.

Roenckner, Thompson, and Brown (1971) point out that a distinct advantage in using ARC as a measure of clustering is that it should not be affected

by the number of recalled items. An analysis of the average within cell correlation between ARC and 1) the number of items recalled ($\underline{n}$ = .13, p > .10) and 2) number of errors ($\underline{n}$ = .15, $\underline{p}$ > .10) bore this out in the present data. This shows that individual differences in the size of the memory set don't automatically produce a higher clustering score (as would be the case with the SCR index). When size of the memory set was experimentally manipulated by exposing 9 (the 3 x 3 matrix), 15 (the 3 x 5 matrices), or 25 (5 x 5 matrix) stimulus items, again no effects were found on the amount of clustering.

Three explanations of the familiarity effect. The high and low familiarity stimulus sets used in the preceding studies differed from another in two ways. The names used to designate the stimulus person were selected to be either familiar or unfamiliar. Second, the information items describing each person were either familiar or unfamiliar. That is, since the items were selected so that they all pertained to one well known person, the items may have a high degree of associative overlap. The inter-item associations may be stronger in the familiar than in the unfamiliar sets. Note in Figure 1 that Bob Hope is old and conservative, Clint Eastwood is tough, rugged, and virile, and Jerry Brown is outspoken and independent. Although occasional instances of semantic relatedness occur for the unfamiliar persons (e.g., tough and outspoken for Stephan Falcon in Figure 1), they seem to occur much less frequently.

This potential confound was purposely retained in our stimulus sets to insure inclusion of the two kinds of familiarity that exist in day-to-day life. In this research, name familiarity results from having frequently encountered information about that person in the past. On the other hand, information about a new person may "seem" familiar because of high inter-item associations. The information may fit together in a way that suggests a "type" of person, such as the high achiever student or the cantankerous old curmudgeon.

Including both types of familiarity in the manipulation insured that if either affects clustering in free recall, those effects would be detected. Now that such effects have been obtained, the next step is to isolate the separate contribution of each.

Distinguishing between name familiarity and inter-item association strength is the first step in providing a theoretical analysis of the processes that underly the effects of familiarity on clustering. The overall effect may have been produced by one (or more) of the following three processes.

Name discriminability could have operated by providing a greater incentive to recall the information by name for familiar than for unfamiliar names. Familiar names would be easier to recall and therefore provide a more convenient starting point for memory search during the retrieval stage. According to this explanation, the nature of the information describing the person is irrelevent. If correct, it suggests that our findings were not necessarily due to the organization of information in memory, but due primarily to the nature of the information search at the retrieval stage. If this is the case, then familiarity of name should affect clustering independently of the information in the stimulus set.

The strength of inter-item associations could have produced the effect independent of whether a person name was linked to the information items. If the familiar information sets do, in fact, possess high inter-item associations in comparison to the unfamiliar sets, then the clustering effects could have resulted from this differential associative structure. That is, accessing one item from a high association set will readily bring to mind other items from that set (and therefore the subject will record them contiguously in the recall task). This is less likely to occur in the low association sets. This explanation of the clustering effects assumes they are due to the nature of information organization in memory rather than a result of retrieval processes.

If the obtained clustering effects were due to this explanation, then the association value of the information sets should have the same effects on clustering, regardless of name familiarity.

A third explanation stems from the possibility that subjects use specific person schemas in their organization of new information about familiar persons, but not with unfamiliar persons. For famous persons, the schema involves strong associative bonds between the person's name and a number of other facts about the person. When information items are encountered, the person may fit them into this already existing structure. Since no such schemas are available for unfamiliar persons, little person clustering should occur with unfamiliar names, regardless of whether they are linked to high or low association stimulus sets.

Two versions of this explanation can be identified. It may be that schema only affect clustering when the stimulus item either is already a part of the schema or is strongly linked to an existing schema element. Such strong associative pathways may be a prerequisite for the recall of one information item to elicit another item in the same schema. If true, it would mean that the only time that strong person clustering would occur is when the information items to be recalled are relevent to the schema. If low association stimulus sets were linked to familiar names, the amount of person clustering would be low and similar to that obtained when the low association sets were linked to unfamiliar names.

A second version of the person schema explanation is based on the possibility that a person schema can affect clustering even for information items that were not originally a part of the schema. Although most of the items in the low association stimulus sets were not selected to be part of the schema of the famous persons, it is possible that subjects could find meaningful linkages between them and the person schema. For example, there is a sense in

which Muhammed Ali is self taught, handsome, and a politician. To the extent
that this version of the person schema explanation holds, it would be expected
that the amount of person clustering observed when low association items are
paired with a familiar name should be greater than when they are paired with an
unfamiliar name. However, since these linkages to the schema would be weaker
than for information is directly related to the familiar person schema, the
amount of clustering should be less than is found in the completely familiar
case.

Tests of the three explanations. An experiment by Pryor and Ostrom was
designed to assess the base-rate clustering that might be attributable to
inter-item associations in the stimulus sets used in the experiment above. If
the effect of familiarity was exclusively due to high vs. low inter-item
associations, similar clustering differences would be expected even if no names
were attached to the descriptors at the time of stimulus presentation.

Twenty-four subjects were presented with the 25 descriptors from each of
the four stimulus sets. The descriptors were presented without any person
names attached. Subjects read through each stimulus set three times (the
desciptors were printed on index cards), each time in a different shuffled
order. They then were instructed to recall the descriptors, writing them
down in the order they came to mind. Subsequently, subjects were given one
additional exposure and a second recall trial. The order of the four stimulus
sets was counterbalanced across subjects.

Each recall protocol was given two clustering scores. The familiar person
categorization of descriptors (e.g. the rows in Figure 1) were used for computing
one score and the unfamiliar person categories (the columns in Figure 1) were
used for the other. The resulting two clustering indices were analyzed as
repeated measures. The means of these two ARC scores were

.07 for the familiar (or high association) sets and -.02 for the unfamiliar (or low association) sets. Although this difference is small and both values are near zero, the difference was statistically reliable ($F_{(1, 44)} = 11.759$, $p < .01$). No effects were found due to trials or stimulus replications. These results indicate that a difference in inter-item association may have accounted for some part of the clustering results of the first experiment. When the very small magnitude of clustering observed in this study is compared to the relatively robust clustering tendencies observed in the first experiment, the additional influence of other processes is suggested.

The next study also conducted by Pryor and Ostrom was designed to simultaneously assess all three alternative explanations of the familiarity effect (name discriminability, inter-item association, and person schema). The basic variables involved in this study are perhaps best understood by referring back to Figure 1. In this study the pairing of names and descriptor sets was manipulated orthogonally. Familiar names were presented in conjunction with either the high association or low association descriptor sets (the rows or columns, respectively, from Figure 1). Likewise, unfamiliar names were presented with either high or low association descriptor sets. The basic experimental design, then, was a 2 (familiar vs. unfamiliar names) by 2 (high vs. low association descriptor sets) factorial. Subjects saw all four of these conditions, each with a different stimulus replication (replications were latin square counterbalanced across conditions over subjects). Another factor in this experiment was stimulus set size. Half the subjects received 9 item sets (3 persons x 3 descriptors) and half received 25 item sets (5 persons x 5 descriptors).

Thirty-two subjects participated in this experiment. Subjects were told that the experiment concerned their memory for information about persons.

The information items for each stimulus set were printed on index cards in the form of sentences.

The descriptor word in each sentence was underlined. Subjects were instructed to remember the underlined words as they read through each stimulus deck, saying the sentences aloud. The rationale for having subjects remember only the descriptors involved reducing the number of recall errors by simplifying the response task. It should also help solve an interpretive problem with the previous procedure. It should reduce subjects tendency to use the name written down on the preceeding response as a retrieval cue for the next response.

The subjects went through two exposure and two recall trials for each of the four stimulus decks. The order of cards within each deck was arbitrarily determined by shuffling for each exposure. Subjects' recall protocols were scored for clustering around the stimulus persons.

Each of the three alternative explanations for the familiarity effect makes a different prediction for this study. The name discriminability explanation predicts that the only significant effect should be the name familiarity main effect. Name discriminability should be just as influential when paired with low or high association item sets. Conversely, the inter-item association explanation predicts only a main effect due to the item set factor. This effect should occur under both levels of name familiarity.

If person schemas are activated in this research task, an interaction between the two above factors would be expected. As noted previously, there are two versions of the person schema explanation, both involving the prediction of an interaction. They have in common the expectation that when an unfamiliar name is used, no person schema should be evolked. Consequently, they both predict that there will be no difference between the high and low association stimulus sets when an unfamiliar name is presented.

The first version of the person schema explanation required that the information sets contain items that were already a part of the schema before the schema would facilitate clustering. This means that the familiar name/high association value condition should produce higher clustering that the other three and that those three should not differ from one another. The second version of the person schema explanation relaxed the requirement that the information item be an explicit part of the preexisting schema. It allowed for the possibility that people could discover or create lines of association between each stimulus item and one or more elements of the schema. In this case, it would be expected that the familiar name/low association value condition be lower than the familiar name/high association value condition, but higher than the other two.

The data of this study (see Table 1) clearly favored the name discriminability and interitem association explanations over either version of the person schema explanation.

Insert Table 1 about here

The main effect for name familiarity was significant ($\underline{F}(1,24) = 13.58$, $\underline{p} < .001$), which supports the name discriminability explanation. Also the main effect for item set was significant ($\underline{F}(1,24) = 13.61$, $\underline{p} < .001$), which supports the interitem association explanation. Consistant with both was the finding that the interaction was not significant ($\underline{F}(1,24) = 1.19$, $\underline{p} = $n.s.). All the above findings held for both the small (3x3) and large (5x5) stimulus sets.

The absence of a significant interaction is contrary to the predictions of the person schema explanation. The second (or more relaxed) version came closest in that it correctly predicted that the familiar name/low association cell should be between the familiar name/high association and unfamiliar name/low association conditions.

However neither version anticipated that the unfamiliar name/high association condition would be above the baseline established by the unfamiliar name/low association condition.

It is clear that the first (or strong) version of the person schema explanation cannot account for the outcome of this study. However with some adjustment, it is possible that the more relaxed version could have been operating. It may have been that in the unfamiliar name/high association condition that some of the subjects were able to recognize the famous person from the descriptor set and employed the schema for that person during recall. Even though the tall, bearded, honest, self-taught leader was given the name of Stephen Falcoln in this condition, some subjects may have thought to themselves that this stimulus person sounds like Abraham Lincoln. Unfortunately, subjects were not asked at the end of this study whether any of the unfamiliar persons reminded them of other well known persons.

This study, then, ruled out only one explanation of the familiarity effect on clustering in free recall, that being the strong version of the person schema explanation. This still leaves three possibilities. Although the more relaxed version of the person schema explanation has the advantage of accounting for all the findings in terms of just one theoretical process, we cannot rule out the simultaneous operation of the name discriminability and inter-item association explanations.

One clear conclusion from this study is that the original familiarity effect cannot be fully explained on the basis of processes operating at the time of retrieval. Name discriminability, a retrieval process, could account for the name familiarity main effect, but not for the effect of high vs. low association value item sets. At least one component of person familiarity, then, reflects the nature of how information is organized in memory.

Whether the effect of name familiarity on clustering was a retrieval process (via name discriminability) or an organizational process (via person schema) remains to be determined.

One useful approach to this problem is through the use of "multiple operations." Pryor and Ostrom (1979) have shown that person familiarity affects other kinds of responses besides clustering in free recall. At least one of these, speed of descriptor recognition, supports the view that organizational processes underlay the familiarity effects. This is consistent with other research using a recognition time methodology to study the organization of person information, Smith, Adams and Schorr (1978) have shown that descriptors themat- ically related to the person schema are recognized more quickly than unrelated ones. Anderson (1977) has shown that with repetition items of person information become more strongly linked to the organizing node of the person. Both these factors would appear to differentiate our familiar from our unfamiliar persons at the organizational level.

In both the first and third studies of this series, unfamiliar information about strangers was not organized in recall according to persons. The clustering indices in those conditions were not significantly greater than chance. Among other concerns that arise from this finding is the question that if the infor- mation is not organized according to persons, then how is it organized? The next series of studies was aimed at exploring alternative ways people might be organizing social information in memory.

Alternatives to Person Organization

The previous studies indicated that social information is most likely to be cognitively organized according to persons when the information constitutes familiar descriptors concerning familiar persons. The organization of unfamiliar information about strangers according to persons emerged only under repeated exposures. It is important to note that the information sets used in these

experiments could not readily be organized in any other manner except according to persons. Efforts were made to keep the stimulus persons within a set relatively heterogeneous and the information items were randomly ordered. Therefore, it seems reasonable to infer that other types of cognitive organization might typlify the mental representations of information concerning strangers.

In our laboratory, two types of competing cognitive organizations have been studied in conjunction with person information: (1) descriptor organization and (2) temporal organization. Descriptor organization refers to an organization based upon semantically related descriptor categories. For example, information items might be cognitively classified as being instances of hometowns, part-time jobs or hobbies. Temporal organization in our experiments refers to an organization based on the temporal order in which blocks of information are received. For example, information items may be presented in consecutive blocks on different pages of a questionnaire, where a block contains one item about each of the persons.

Two experiments that examine the role of competing organizations in the recall of person information are presented below. Unlike the preceding studies, these structure the information sets in that explicit alternatives to person organization are available. In addition, these experiments also explored the role of different task demands in mentally organizing person information.

Descriptor organization. Simpson (1979) conducted several studies employing competing descriptor category designs. Three of these studies involved unfamiliar descriptors about strangers. Since the results of these studies are quite similar, only one will be described in any detail. Below is an example stimulus set used in Simpson's research.

> Dave is a part-time usher.
>
> Dave is from Witchita, Kansas.
>
> Tom is from Richmond, Virginia.
>
> Tom enjoys collecting beer cans.
>
> John enjoys collecting coins.
>
> Tom is a part-time dishwasher.
>
> John is from Denver, Colorado.
>
> Dave enjoys tinkering with cars.
>
> John is a part-time farmworker.

There are two alternative ways this information can be organized. The information items may be grouped according to the persons Dave, Tom, and John. Or they may be seen as instances of the categories: part-time jobs, hobbies, and hometowns. Thus, person and descriptor organizations are orthogonal within this set.

Subjects in this experiment (N=32) were presented with nine information items like those in the set above. They were in a written format with each item on a consecutive page. The order of the items was arranged so that if subjects recalled all of the items in the order they were presented, clustering would occur at exactly a chance level for both the person and descriptor organizations.

In the previous studies, subjects were in a learning set when they received the information. The present study had subjects focus of forming impressions from the information. Two kinds of impression sets were used.

Half of the subjects were given the task of forming impressions of how compatible the three persons in a stimulus set would be as college roommates for an academic year. The other half were asked to form an impression of which person in each group would least fit in as a roommate for an academic year.

The second judgment task was intended to promote the cognitive individuation of the stimulus set according to persons, while the first was intended to merely encourage the subject to attend to the information.

Procedurally, the subjects were 1) informed of the judgment task and given the names of the persons to be judged, 2) presented the stimulus set, 3) required to make the judgment, 4) given a distractor task and 5) tested for recall. This exposure/recall sequence was repeated one additional time. The purpose of including a distractor (which in this case involved picking the names of famous psychologists from a letter matrix) was to insure that recall was not just a function of regurgitating the contents of short term memory.

An analysis of the ARC indices derived from the recall protocols revealed several interesting results. First, there was no evidence that subjects organized their recall according to persons. The mean ARC for person clustering was .05 which was not significantly different from chance, $F < 1$.[1] Nor was this index affected by exposure/recall trials $F < 1$. However, there was evidence that subjects organized their recall according to descriptor categories, $\bar{X} = 0.24$, $F(1,16) = 5.59$, $p < .03$. This measure was also unaffected by exposure/recall repetition, $F < 1$. The between subjects variable, task orientation,, failed to produce any significant effects with regard to either person or descriptor clustering.

The main results of this study were duplicated in another experiment, also reported in Simpson (1979), in which photographs were substituted for the names in the stimulus sets. In this replication only the group-compatibility-as-roommates judgment was required of subjects.

The results of these studies are congruent with the findings reported above that unfamiliar persons are not likely to serve as organizing foci for social information. Physical information such as age, race, height, and sex are all readily apparent when meeting a number of new people (e.g. attending a cocktail party

or starting a new job). In such circumstances, one might remember that all the women were outspoken, but not remember which woman said what. One might expect such descriptor organizations to dominate the representation of information about unfamiliar persons.

Another factor that appears to affect the organization of information about unfamiliar others is the amount of information (or memory load) acquired about the persons. Rothbart, Fulero, Jensen, Howard, & Birrell (1978) found that under high memory load information is organized by trait characteristics and under low memory load its organized by person. Presumably, then, the tendency of Simpson's (1979) subjects to organize by descriptor would have been even greater had he used a larger number of stimulus items.

One question left unanswered in the preceeding study is: how information about familiar rather than unfamiliar persons is cognitively organized when such salient competing descriptor categories are present. While the next and final study reported in this series does not use a competing category design that involves descriptor categories, never-the-less addresses the general question. Indeed, the competing categories involved in the next study are perhaps even more immediately salient than those involved in the last one.

Temporal organization. One of the variables that potentially influences the cognitive organization of the social information we encounter is the spatial-temporal sequence of our experience. For example, we may remember several facts that we encountered concerning the people with whom we had lunch today, several items of information which were discussed in a faculty meeting this afternoon, and several messages heard on the radio coming home from work. Significant spatial-temporal contexts may thus serve to organize our experiences. In studies from the cognitive literature, this sort of organization is often operationalized by "blocking" stimulus information into discrete groups.

While social experience is perhaps not often blocked into units as distinct as those employed in cognitive experiments[2], there are chronological conventions such as general times of the day (morning, afternoon, night) or even days of the week that may serve as organizing foci.

The present experiment (conducted by Pryor and Ostrom) attempted to operationalize blocking in a manner that would seem relevent to the manner in which we usually encounter social information. The principle aim of the experiment was to observe the organizational influence of temporal categories upon person information across varying conditions of person familiarity. A secondary concern was to further explore the possibility that differential judgmental sets may mediate organizational tendencies.

Forty-eight subjects participated in this experiment. Half of the subjects were given Memory set instructions and the other half were given Impression set instructions. In the Memory set condition subjects were merely told that they would be given information sets about persons and would subsequently be asked to recall the information. In the Impression set condition subjects were given the same memory instructions and in addition, they were told that they would have to make favorability ratings of each of the several persons described in the information sets. These person ratings were to be made from memory. It was hypothesized that the Impression set instructions would tend to encourage a person-by-person representation of the information in comparison to the Memory set instructions.

The information sets used in this study were the same 3 persons x 3 descriptors sets used in our original familiarity study (see Figure 1). The information items included names and descriptors. The descriptors were underlined and subjects were told to try to remember the underlined words. Each subject received two familiar and two unfamiliar sets. Order of the stimulus sets and familiarity conditions was counterbalanced. Each stimulus information set was blocked into

three groups of three items each. Within a block was contained one item concer-
ning each stimulus person in the set. Blocks were presented on consecutive pages
in a test booklet. At the top of the page containing the first block was:
"Imagine that on Monday you found out the following information." The second
block was labeled Tuesday and the third, Wednesday. The information items were
randomly ordered within each block.

Following presentation of a stimulus set, subjects were given a one minute
distractor task that involved counting backwards from a three digit number (e.g.,
697) by threes. Next, subjects were asked to recall all of the descriptors they
could and write them on a single page in the order they came to mind. Finally,
subjects in the Impression Set condition made a favorability rating of each
stimulus person on a seven point scale. Each subject went through this entire
procedure for each stimulus set three times. The order of the information items
within a block was counterbalanced over trials.

Each recall protocol was given two clustering scores, one based on persons
and one on the temporal blocks (day of the week). These two ARC indices were
treated as repeated measures. The variables of theoretical interest in this
experiment constituted a 2 (set) x 2 (person familiarity) x 2 (ARC index)
factorial design.

One of the main reasons for doing this study was to explain whether person
familiarity affected the extent to which non-person forms of information organi-
zation would be used. Of primary interest, then, is the interaction between
person familiarity and clustering index. Figure 3 shows that, as in the previous
studies little person clustering is found with unfamiliar stimulus persons.

Insert Figure 3 about here

There was a significant interaction (F (1,32) = 87.54, p < .001) that was caused
by temporal clustering being greater for unfamiliar than familiar persons. This
finding, along with that in the preceding study establish that people tend to
prefer non-person bases of cognitive organization when the social information
is about unfamiliar persons.

There was also a significant two-way interaction between the set manipulation and cluster coding, $F(1,32) = 7.17$, $p < .02$. This interaction is depicted in Figure 4. When the subjects task is to form an impression, they show a strong preference of person organization over temporal organization; however under Memory Set conditions neither organization clearly dominated over the other.

Insert Figure 4 about here

Thus, the Impression Set instructions functioned as hypothesized.

Another interaction was obtained between the Familiarity and the Set factors, $F(1,32) = 5.595$, $p < .03$. The basic nature of this interaction was that, summing over person and temporal clustering, more clustering was detected in the Familiar, Impression set condition than in the other conditions. One interpretation of this finding is that more overall organization of social information occurred in this condition than in the others. Subjects were able to use person organization and temporal organization simultaneously. However, since the person and temporal ARC indices tended to be negatively correlated, any interpretation would seem somewhat speculative. Finally, it should be noted that the number of presentation trials had no clear effect on organizational tendencies.

These results replicate the findings of the familiarity series of experiments: person-by-person organizations of social information tended to occur only under familiar conditions. Furthermore, other forms of cognitive organization seemed to emerge and dominate when information concerned unfamiliar persons. It is also interesting to note that person-by-person organizations of familiar person information seemed to be utilized in recall even when salient competing organizational categories were present.

The findings vis-a-vis the set manipulation suggest that situational demands concerning the expected used of person information may affect the manner in

which it is organized in memory. Thus, these findings suggest ways in which different cognitive organizations of person information may be encouraged. This is particularly important considering that, as we note below, the way social information is cognitively organized may have important implications for social behaviors.

Discussion

Previous research in person perception has not questioned the assumption that social information is organized according to persons. The research reported in this chapter suggests that such an organization only occurs under certain circumstances; namely, when the information concerns familiar persons. A variety of other implications arise when one questions the "person organization" assumption made by previous researchers. In this section we shall discuss (a) alternative forms of cognitive organization, (b) behavioral consequences of person organization, (c) possible individual differences, and (d) affective considerations.

Alternative Ways of Organizing Social Information

One of the first questions of interest has to do with identifying alternative modes of organization. When people are not organizing social information by person, how are they organizing it?

The last two studies reported above confirm the existence of two alternative modes of organization: descriptor and temporal organizations. Below we will suggest yet other organizational modes and describe how the several alternatives relate to the Anderson and Bower (1973) models of associative memory.

As an item of social information is received, the perceiver no doubt forms many associative linkages. In a computer simulation of Human Associative Memory (HAM) developed by Anderson and Bower (1973) information is "parsed" or organized according to several idea nodes. The first two nodal divisions assigned to incoming information are a "fact node" and a "context node." The "fact node" is

further divided into a subject node (which is comparable to the person node under investigation in the present studies) and a predicate node. The predicate node is further subdivided into verb and object nodes (These latter nodes refer to the person features conveyed by the information items.)

The second major nodal division (the "context node") is sub-divided into location and time nodes. They refer to the place (or context) and time (or sequence) in which the factual information items occurred. This latter nodal organization is quite similar to the temporal organization operationalized by blocking in the Pryor and Ostrom (1979) study mentioned above.

Nodes are interconnected in a hierarchical fashion through associative pathways for each information item. A person feature (i.e., the "predicate node") will frequently be linked to superordinate descriptor categories. In the Simpson (1979) study, the person feature "enjoys tinkering with cars" had a pre-existing linkage to the descriptor category "hobby". Similarly, a skin color feature (e.g., yellow) has a pre-existing linkage to a racial category (e.g., oriental).

In terms of human associative memory, the organizational influence of any node in this network is determined by the associative strength of the pathways connecting it to other relevant nodes. Associative strength is thought to be determined by the number of intervening nodes and the frequency with which the pathway between nodes has been activated (Anderson & Bower, 1973; Collins & Loftus, 1975).

The theoretical framework provided by Anderson and Bower suggests three ways social information can be organized in addition to a person-oriented organization. The fact that social information is temporally ordered (or blocked) provides one alternative form of organization that was verified in one of our studies. This temporal information is represented by the time node. For example, in some coffee shops two or more waitresses frequently serve the same customer.

As a customer, you may recall the sequence of acts on the part of the waitresses (e.g., brought menu, took order, poured coffee, and looked impatient while you were finishing). You may, however, not be able to identify which of the several waitresses did each of the acts. Not only can people organize on the basis of temporal sequence, but they can organize around specific dates. Most older people can probably remember what they were doing on their 21st birthday; Yarmey & Bull, (1978) found that 97% of a large sample of Americans and Canadians could remember (when asked in 1976) what they were doing on November 22, 1963.

A second alternative to person organization is organization around situational or contextual features of the social information setting. This is represented by Anderson and Bower's location node. For example, people find it easy to recall social encounters that occurred while on vacation, when attending costume parties, or while visiting public restrooms.

The third alternative emerges from the nature of the person features stored in the predicate node (which consists of the verb and object). Many features can readily be classified into broader descriptor categories. One of our studies showed that for unfamiliar persons, items of social information may be linked more strongly to nodes representing these descriptor categories than to person nodes. For example, you may come away from a party remembering you met a policeman and a fireman, and that one was in his 20's and one was in his 40's. However, you may find it impossible to recall which was which. It would be clear in this instance that the information was organized by the descriptor categories of occupation and age rather than by the persons.

A fourth form of social information organization of particular interest to social psychologists (and one not directly suggested by the HAM model) is organization according to the self. We may organize person features on the basis of being similar or dissimilar to ourselves (e.g., Markus, 1977; Rogers, Kuiper, &Kirker, 1977). This form of cognitive organization would go beyond the immediate factual nature of information and emphasize an integration with one's

recollections of one's own past experiences.

One issue that has yet to be addressed is whether social information can be simultaneously organized according to two or more of these alternatives. The associative network model would allow for this possibility since information items are linked to a variety of these organizational nodes. The data from our study on person vs. temporal clustering (where the total amount of person plus temporal clustering was greatest for familiar persons) suggests that the ability to access social information through several organizational alternatives occurs primarily for familiar persons.

Descriptor organization and stereotyping. Of these four alternative organizational modes, perhaps the most relevent to past work in social psychology is the third, organization by descriptor. When a particular behavior or person feature dominates the organization of information concerning some person, other behaviors or characteristics of that person may become less accessible in memory. We believe it is this type of organization that forms the basis of stereotyping.

It is interesting to note that stereotyping is one area in social psychology that has not adopted the assumption that social information is organized around persons. Stereotypes represent exactly the opposite process; social information is organized around a descriptor category (e.g., ethnic label, gender designation, mental illness label) and the unique features of each group member are ignored or forgotten. Studies which would contrast a person-dominated organization to a descriptor-dominated organization offer the potential of integrating person perception processes and stereotyping processes under the same conceptual structure.

Two kinds of settings appear promising in studying descriptor organization, settings that contain crossed and settings that contain nested information ensembles. Crossed information ensembles refer to circumstances under which the observer receives the exact same categories of information about all persons.

The study by Simpson (1979) is an example of this sort of design. We may infer that organizing by descriptor categories obfuscates the relationship of particular descriptors to particular persons.

Nested information ensembles refer to settings in which there is only one dominant feature used to classify persons (e.g., race or sex) and several distinct (non-crossed) items of information are received about each person in each category. For example, say you meet two whites and two blacks, and learn several different facts about each. You may remember the facts about the whites and the facts about the blacks, but not be able to recall which fact went with each person within a racial category. This was the situation studied by Taylor, et al (1978).

Through systematic variation of the qualities that are potentially important to the formation of person nodes, it should be possible to gain an understanding of how person nodes can come to exert an influence in the context of highly influential descriptor nodes. Such a line of research has a rich potential for the understanding of stereotyping and how one might encourage the consideration of persons as individuals.

A final point to be mentioned regarding person vs. descriptor organization is the potential effects of memory on decision making. Memory-based judgments are dependent on the accuracy and specificity of information available from memory. The mode of organization is certain to affect the amount of information one can retrieve from the original information ensemble, and the nature of the reconstructive errors introduced.

Behavioral Consequences of Person Organization

Another avenue for future investigation involves the overt behavioral manifestations of cognitive organization. Research by Wilder (1977) has already examined some conceptual issues that are relevant to this concern. Wilder found that the social influence of persons in a conformity situation was greater when subjects were encouraged to perceive them as individual "social entities" than

when subjects were encouraged to perceive them as members of a group. While Wilder did not directly assess the cognitive representation of the stimulus persons in his experiments, it is reasonable to suggest that a single node was used to represent all persons when they were perceived as members of the same group and that each person was represented by a separate node when they were perceived as separate social entities. Future research may be designed to combine the methodologies proposed in this chapter with the methodologies described by Wilder. In this way, cognitive and behavioral indices of person node formation may be assessed within the same setting.

An additional question that may be posed in this same conceptual vein is: Are persons who are cognitively represented in terms of highly organized person nodes more likely to be treated as individuals in a behavioral sense? Research along these lines might ultimately lead to a better understanding of the cognitive bases of discriminatory behaviors. Are administrators more likely to withhold resources from a group cognitively organized by descriptor (e.g., an out group) than from a group organized (at least in part) by persons?

Individual Differences

Another direction for future research involves the role of individual differences. There may be individual preferences for cognitively organizing social information according to person or descriptor categories. It may be that people with a chronic inability to relate to others as individuals suffer from a deficit in their capacity to organize social information by person. If so, it would be worthwhile to develop training programs to facilitate person organization.

Certain descriptor categories may be dispositionally preferred to other categories. This is directly implied by the work of Kelly (1955) and Rosenberg (1977). Also, there may be general organizational preferences related to self-schemata (Markus, 1977; Rogers, Kuiper, & Kirker, 1977). Organizational

preferences may also evolve from past experiences that impose a highly organized categorical structure upon person information, e.g., the reliance on particular diagnostic categories (Chapman & Chapman, 1969).

Affective Considerations

The final conceptual factor that we will mention as a possible avenue of future investigations is the role of affect. How does affect (or emotion) influence the formation of person nodes? At least two possibilities should be explored. In relation to discriminability, sentiments may influence one's focus of attention. A person may become a salient organizing theme because the feelings which an observer has toward that person may consistently direct the observer's focus of attention toward the person.

On a different level of analysis, one might suggest that the associative dynamics of memory that have been described in this chapter are primarily characteristic of nonaffective thought processes. Although the trends in cognitive psychology direct us to explore rational information processing, it is possible that emotional factors circumvent rational processes. On the other hand, emotional states may serve only to intensify the influence of a dominant organizational mode. In either case, the influence of emotional factors deserve further attention in experimental investigations.

Footnotes

[1]The scoring of the recall protocols for clustering in this experiment involved a slightly different strategy than was used in experiments hitherto described. Recall responses were included for analysis if they involved only a correct descriptor (without a name) or if they involved a correct name/descriptor pairing. Again errors were ignored.

[2]It should be noted that some theorists (e.g., Newtson, et al. 1978) maintain that the stream of social experience is organized into discrete, consensually-perceived units.

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Table 1

Mean Clustering Scores (ARC) as a Function of Name

Familiarity and Descriptor Set Association Value

		Association Value of Descriptor Set	
		Low	High
Familiar		.37*	.66*
Names			
Unfamiliar		.17	.37*

Note. Perfect clustering is indicated by an ARC of 1.0 and chance by zero.

* Mean ARC greater than chance, $p < .05$

Figure Captions

Figure 1. Example of stimulus set use in the first familiarity study.

Figure 2. Mean clustering index (ARC) as a function of person familiarity and trial.

Figure 3. Mean person and temporal clustering indices (ARC's) as a function of person familiarity.

Figure 4. Mean person and temporal clustering indices (ARC's) as a function of instructional set.

UNFAMILIAR PERSONS

FAMILIAR PERSONS	Stephan Falcoln	Don Carr	Alexander Cox	Clark Patterson	Chuck Cooke
Abraham Lincoln	TALL	HONEST	SELF-TAUGHT	LEADER	BEARDED
Bob Hope	GOLFER	OLD	CONSERVATIVE	COMEDIAN	HARD-WORKING
Muhamed Ali	RELIGIOUS	ATHLETE	CHAMPION	BLACK	OPINIONATED
Clint Eastwood	TOUGH	ACTOR	HANDSOME	RUGGED	VIRILE
Jerry Brown	OUTSPOKEN	BACHELOR	POLITICIAN	CALIFORNIAN	INDEPENDENT
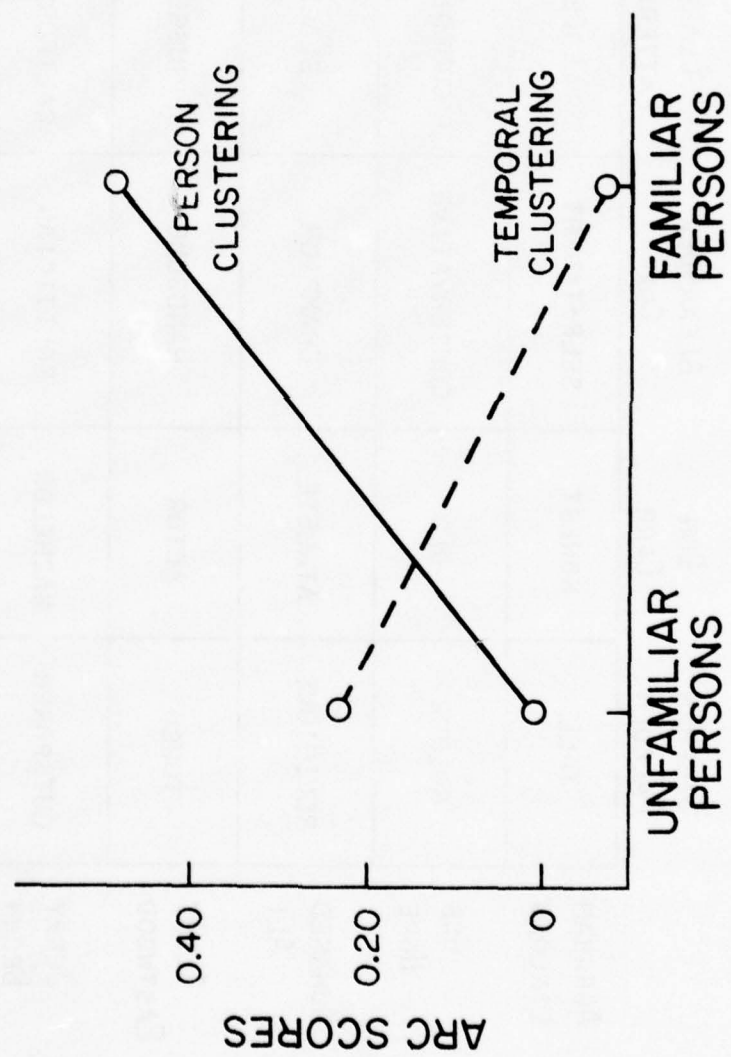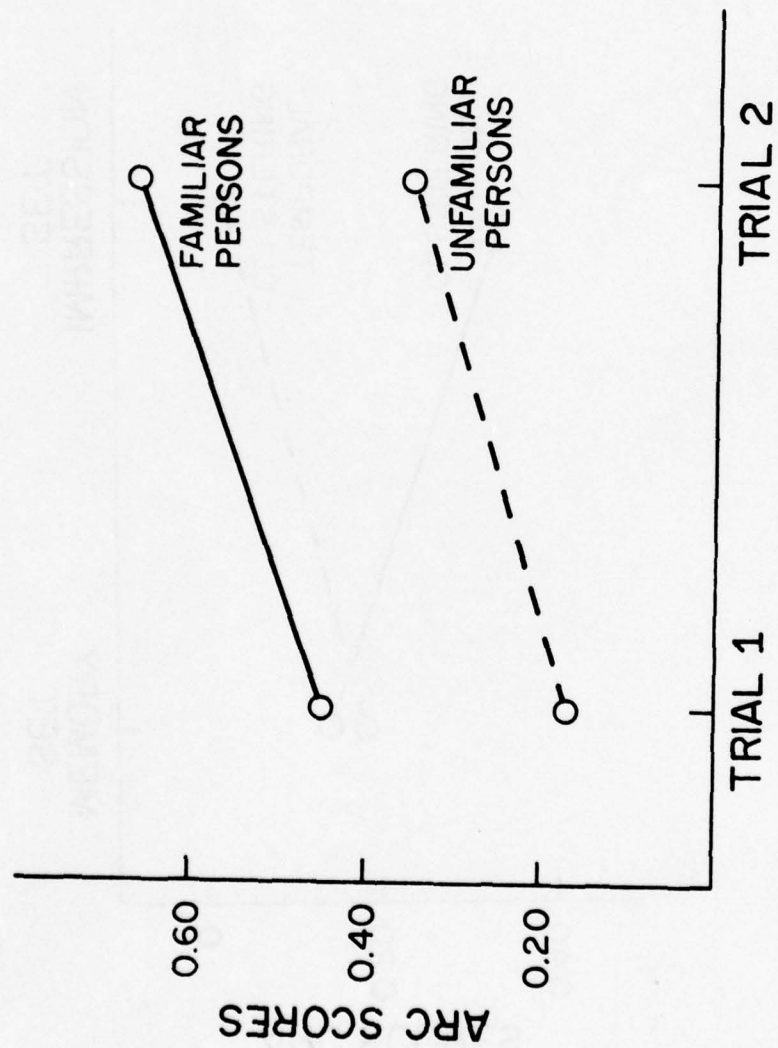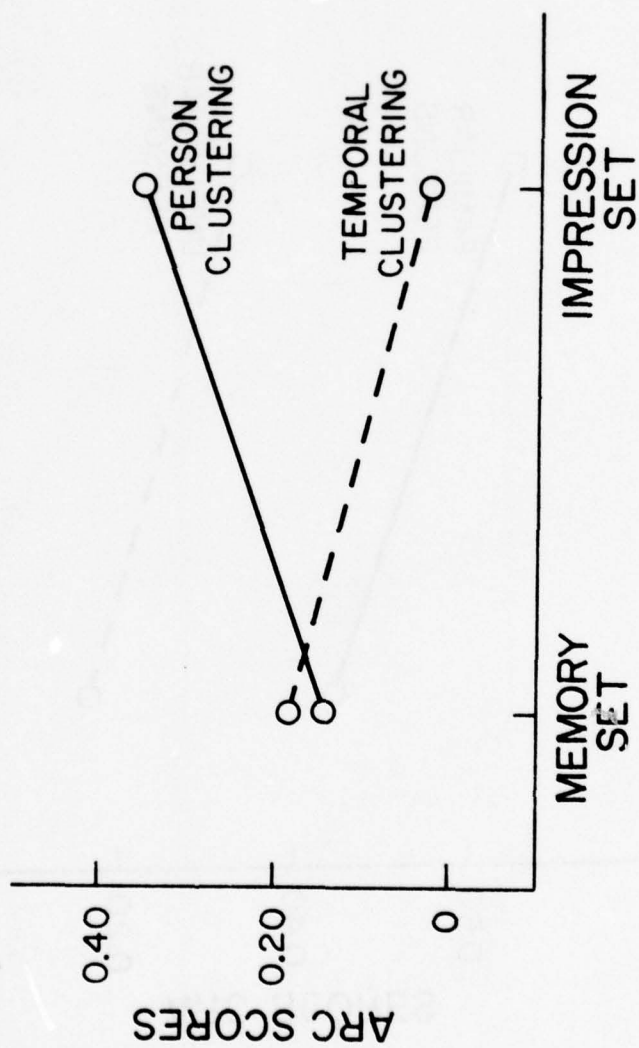
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